Summary
Steller Sea Lion Recovery Team Meeting
Islands and Ocean Center, Homer, Alaska
14-16 September 2004

Vernon Byrd opened the meeting of the Steller Sea Lion Recovery Team (SSLRT or RT) at 08:30 on September 14. Chair Bob Small was delayed and arrived later. Greg Siekaniec, Manager of the Alaska Maritime NWR, welcomed the RT to Homer and to the new refuge offices at the Islands and Oceans Center. After Byrd reviewed the agenda, Fritz reported on survey results from the summer 2004 field season. Most of the Alaskan SSL range was surveyed during 2004, and for the first time the medium-format camera system was used at all sites. Gross counts at trend sites increased 11% when compared with 2004 counts using the 35mm format. Since medium-format techniques typically yield 4-6% higher counts than 35mm methods, Fritz expects that the actual increase in 2004 is comparable to the 2000-2002 increase of 4-6%. The only region in which counts decreased was the Central Gulf of Alaska (Outer Island though Chirikof Island). Fritz noted that counts at sites in the Aleutians were consistently higher than during the previous survey. Since much of the increase in the Western Gulf was attributable to one site (Chernabura Island, ~500 animals), these preliminary estimates must still be reviewed. Surveys at some of the major rookeries in Southeast Alaska (e.g., Forrester Island) were not conducted during 2004, but available counts suggest that SSL populations in this region remain stable or are increasing.

Summary of AFSC Fisheries Interaction Team (FIT) Research
Libby Logerwell, National Marine Fisheries Service

The mission of the Fisheries Interaction Team (FIT) is to determine (a) whether commercial fisheries result in localized depletion and/or disruption of SSL prey fields, and (b) the efficacy of existing protection measures (trawl exclusion zones). Current studies examine three groundfish species: walleye pollock, Pacific cod, and Atka mackerel. All studies involve at-sea experiments; the pollock and Pacific cod studies are designed to test for localized depletion/disturbance of prey fields while the Atka mackerel study evaluates the effectiveness of trawl exclusion zones. In addition, all studies collect information on the physical oceanographic characteristics of habitat and the biological characteristics of fish. The Pacific cod project includes a tagging program to study cod movement.

The walleye pollock project pairs sites in Barnabas Trough and Chiniak Trough that are in close proximity and have similar topography. The Chiniak site is closed to fishing during the study (control area) while the Barnabas site is open to commercial trawl fishing. The study uses echo integration-trawl (EIT) techniques; acoustics (38kHz) are used to assess fish distribution and abundance, while trawl samples confirm species, size, and age. Researchers make multiple survey passes before and after the start of commercial fishing in late August. The project began with a feasibility study in 2000. Full surveys were conducted in 2001, 2002, and 2004, and fishing effort (based on harvest levels) was described as low, virtually nonexistent, and moderate in those years. No survey was conducted in 2003 because the research vessel was unavailable. The 2001 study did not observe an effect of fishing on local abundance of juvenile (age-1 and -2)

pollock or on fish depth, distance off bottom, or school descriptors. These 2001 results may be confounded by the moderate to low fishing effort in that year, and by the high observed spatial variability of pollock. Results from 2002 are inconclusive, due to the near absence of fishing activity, and have not been published. Results from the 2004 study are not currently available.

The Pacific cod project is conducted in an area of heavy commercial fishing in Unimak Pass. Control and treatment sites are located inside and outside the trawl exclusion zone near Cape Sarachef. The control site is the unfished area within the trawl exclusion zone. The treatment site is the heavily fished area just outside the trawl exclusion zone. The study is the first AFSC cod study to use specially-designed research pots that include trigger timers (to evaluate alternatives to catch and relate catch patterns to tide, currents, etc.) and oceanographic sensors. Short soak times, small tunnels, and large internal volumes attempt to minimize gear saturation. Pots are deployed by charter crab pot vessels before (January) and after (March) a period of intensive commercial fishing. During each period, pots at each site in a sampling grid are visited five times, and catch at each site is averaged. The test statistic measures the percentage change in catch from before to after the fishery. Feasibility tests and gear development occurred during 2001, followed by a pilot study in 2002. A full experiment was attempted in 2003, but "before" sampling was incomplete due to weather and equipment problems. The first complete experiment was conducted during 2004. No localized depletion (at the designed physical scale of 5-10 nautical miles and temporal scale of weeks to months) was detected in 2004. Localized depletion has never been formally defined, but would presumably be a removal sufficient to impact Steller sea lion foraging success. Simulations show that the experimental design has a high probability of detecting the removal of 30% of available biomass. Tagging studies were conducted during 2002 and 2003 to assess fish movement and address concerns regarding the independence of the study areas. Although tagging was opportunistic during 2002 and conducted only during February and March in 2003, no systematic movements between areas were detected. Most movement appeared to occur through the study area to the northeast. No tagging was conducted during 2004.

The Atka mackerel study has been conducted inside and outside the trawl exclusion zones near Seguam, Tanaga, and Amchitka islands. In a mark-recapture study, mackerel are tagged and released during June-July and are recovered during September-October by commercial fishing vessels outside the exclusion zones and by chartered vessels inside and outside the zones. The study uses maximum likelihood methods to estimate population size and the probability of moving. It assumes that the probability of catching tagged and untagged fish are the same, tagging does not affect catchability, the population is closed, tag shedding occurs immediately after tagging, the probability of losing the first tag is independent from losing the second tag, and that mortality associated with tagging occurs within 12 days. Work began with a pilot study during 1999 at Seguam Pass (1,375 fish tagged, 50 recovered), and expanded to full studies at Seguam Pass in 2000 (8,773 fish tagged, 94 recovered), at Seguam and Tanaga passes in 2002 (36,319 fish tagged, 122 recovered), and at Amchitka Pass in 2003 (14,596 fish tagged, 766 recovered). No fish were tagged during 2004 due to insufficient funding. Results from Seguam in 2000 suggest a low probability that mackerel move out from the exclusion zone ($p = 0.003 \pm 0.007$), and a higher probability that mackerel move into the exclusion zone ($p = 0.6 \pm 0.4$). Although the variability associated with the latter estimate was high, Logerwell suggested that the difference may be associated with Atka mackerel spawning behavior. The mackerel biomass

inside the exclusion zone was an estimated 118,000 mt (±90,000), and the biomass outside the zone was an estimated 82,000 mt (±26,000). Results at Tanaga during 2002 were similar; the probability of moving out from the exclusion zone was low ($p = 3.04 \times 10^{-8} \pm 5.92 \times 10^{-5}$), while the probability of moving into the exclusion zone was higher ($p = 0.25 \pm 0.42$). The mackerel biomass inside the exclusion zone was an estimated 71,000 mt (±62,000), and the biomass outside the zone was an estimated 61,000 mt (±25,000). A completely different pattern was observed at Amchitka during 2003. Approximately 43% of the fish tagged inside the exclusion zone moved outside, while 44% of the fish tagged outside the exclusion zone moved inside (compares to 8% and 20%, respectively, at Seguam in 2000). Logerwell suggested that these differences are related to the layout of the trawl exclusion zone at Amchitka, rather than to increased activity of Atka mackerel at that site. She speculated that the zone at Amchitka bisects Atka mackerel habitat.

Plans for the future include a second Pacific cod experiment at Unimak Pass during the winter of 2005, followed by a third experiment there or at another site in 2006. The Pollock experiment will be repeated in 2005 or relocated to another area. Tag recovery in the Atka mackerel experiment will continue in all areas during October 2004, and additional tag release and recovery in the Western Aleutians has been planned for 2005. Logerwell asked the RT for its suggestions on other species/location combinations or fisheries effects (other than localized depletion) that should be considered.

RT questions, discussion and comments:

- RT members raised several concerns regarding the Pacific cod study, a program to which FIT devotes a substantial portion of its budget resources due to the high cost of vessel charter. Some members were not convinced that pots could be used to measure localized depletion. Logerwell acknowledged that pots provide only an index of abundance, but noted power tests suggesting that pots have a good chance to detect the removal of 30% of available biomass. She stated that pots were chosen over trawls because of the prohibitive effort needed to address questions of variability in trawls. RT members questioned the impact of immigration on this power analysis, suggesting that an increasing biomass could reduce the power of the test. Others noted that tagged fish moved a considerable distance in only 8 days, and that any localized depletions could have moved outside the study area during the January-March study period. RT members were interested in depletions that occur over periods of days or weeks rather than months. Some observed that the study area is only a small portion of a much larger fishing zone, and questioned the larger scale impact of the fishery. Others noted that while the area is closed to trawling during sample collection, the commercial pot and longline fisheries are still active.

- Some RT members objected to Logerwell's characterization of the Atka mackerel project as an evaluation of the efficacy of trawl exclusion zones. They noted that the study was designed to measure the movements of fish, and not to detect localized depletion or evaluate impacts on SSL. Logerwell maintained that by evaluating whether mackerel move out from the exclusion zone into commercial fishing areas, the study could assess whether exclusion zones are a "safe haven" for this biomass of potential SSL prey.

- Some RT members were struck by issues associated with precision of technique that appear to affect all of these studies. In some studies, fishery effects must be large to be detectable while other studies are subject to spatial limitations (e.g., test areas are not independent, depletion may not be "localized"). While study designs reflect researchers' original understanding of these systems, RT members suggested that fishery effects may not be apparent at this scale.

- RT members noted that seasonal patterns were sometimes not consistent between years, and suggested that the "snapshot" approach used in these studies may be hard to evaluate. They thought that it may be more productive to relate the observed variability to oceanographic or other environmental features. Others noted that the movements of fish tend to confound the results in all areas. The current Pacific cod study, in particular, was cited as an expensive study that provides little useful information. They suggested that it may be more productive to focus FIT resources on a broader experiment in single study area.

- Several RT members stressed the importance of improving the coordination of these studies with ongoing work by other groups/agencies. They noted that the FIT could benefit from a review of prior and ongoing SSL research in the region. Some suggested that better coordination (e.g., with UA studies around Kodiak) could allow continuation of these types of studies in an environment of reduced funding. Others recommended reactivation of an independent review team to examine research by all groups and to facilitate this coordination.

Preparation and Review of Draft Documents

The remainder of the meeting included small working group sessions to prepare assigned draft documents, followed by discussions and comments on major issues in several of these sections. RT members Behnken and Stump participated in some of the discussions via teleconference. Documents reviewed included: Section V.B.10 – subheadings "Nutritional Stress", "Cumulative, Synergistic, and Ecosystem Effects", and "Threats Table"; Section IV – Conservation Measures; and Section V.D.3 stepdown outline narratives 1.1-3, 2.1-5, and 3.1-5. Draft stepdown outline narratives for sections 5.2-3 and 6.1-7 were available but were not reviewed due to time constraints. RT members with specific editorial comments were asked to submit them to workgroup leaders. Workgroups were asked to prepare new drafts based on the discussions and return them to Small no later than September 24. Small will continue to post the most current draft documents on the intranet site and will distribute them to the RT for review prior to the next meeting. Broader issues developed during the discussions were as follows:

- Several of the "guidelines for narratives" described in the draft NMFS manual for recovery plans were reviewed and discussed. Small noted that each section of the stepdown narratives describe recovery actions that derive from identified threats, so each section should identify (a) the threat number as designated on the threat table, (b) an action priority, (c) duration of the task, and (d) estimated costs (on an annual basis for the first 5 years, and total cost to recovery). He also suggested that RT members also include a research designation (Y or N) to identify those items that should be included in the separate research

plan. He reminded RT members that the narratives should provide a sense of the monitoring actions needed; the priority of monitoring actions will be the same as the recovery action. To provide consistency in format, narratives should be limited to only a few paragraphs in length and writers should strive for no more than three outline sublevels. Narrative sections should generally not include scientific citations; these citations should be confined to earlier background sections. A responsible party must eventually be assigned to each narrative task, but Small indicated these designations would be provided later.

Capron noted that several of the current draft narratives were vague and encouraged the RT to include site-specific action items as guidance for NMFS (e.g., the value of continuing specific research). He suggested that the RP is a living document that could be revised in the future as necessary. Most RT members favored a more generic approach, however, fearing that the RP would rapidly become dated if research recommendations were too specific. They suggested that NMFS could reassemble the RT as an advisory committee on an annual basis to provide research recommendations if that level of input are necessary.

- The RT discussed how to deal with the concepts of cumulative effects, synergy, and cascade theory in V.B.10. Rather than dealing with the topics independently, many favored addressing these concepts in a single section. While each of the listed threats could affect SSL independently, several could occur concurrently (a) for a cumulative or additive effect, (b) for a synergistic effect that exceeds the cumulative impact, or (c) to initiate a cascade in the environment that indirectly affects SSL. Some hoped this approach would encourage readers to think beyond individual lines of the threats table when planning research.

- The RT reviewed the threats table and engaged in an extended discussion of its structure and general contents. Several columns were relocated, threat and descriptive columns were deleted, and the source designation of threats was changed to include more description. Some RT members expressed confusion regarding interpretation of the ranking system used in the threats table, especially whether "Probability of Occurrence" reflects the likelihood of occurrence in the past, present, or future. Several asked for the opportunity to revisit rankings in the threats table once a complete review document has been assembled and can be reviewed in entirety, and the team agreed.

Other Topics

Small reported on the following issues related to RP development:

- Dan Goodman appears to be recovering from his recent medical problems and should be able to resume his PVA modeling work for the RT in the near future. Small will attempt to obtain a contribution on recovery criteria for the next meeting.

- A draft manuscript describing abundance and trends in the Eastern DPS is currently in preparation, and Small suggested that manuscript be used when revising the assessment of population status in the revised plan for the Eastern DPS. Capron emphasized that the RT must consider all five listing factors in addition to absolute population numbers, and must

make a formal evaluation of current threats. Small and Capron will develop and distribute an approach to guide RT consideration of relevant issues for the Eastern DPS.

SSLRT Meeting Schedule

The next meeting of the SSLRT was tentatively scheduled for November 10-12 in Seattle. Small indicated that the final revised drafts of all background and narrative sections could be discussed and approved at the next meeting.

Before adjourning, Small congratulated Loughlin on his recent retirement and thanked him for his contributions to the RT.

The meeting adjourned at approximately 12:10 on September 16.

Table 1. Attendance at the meeting of the Steller Sea Lion Recovery Team held 14-16 September 2004 at the Islands and Ocean Center, Homer, Alaska.

*	Shannon Atkinson	Alaska Sea Life Center & University of Alaska, Fairbanks
~	Linda Behnken	Alaska Longline Fishermen's Association
*	Vernon Byrd	U.S. Fish & Wildlife Service
	Shane Capron	National Marine Fisheries Service, OPR
	Sam Cotton	Aleutians East Borough
†	Al Didier	Pacific States Marine Fisheries Commission
	Tom Eagle	National Marine Fisheries Service, HQ
*	Denby Lloyd	Alaska Department of Fish and Game
*	Dave Fraser	F/V Muir Milach
*	Lowell Fritz	National Marine Fisheries Service
*	Tom Gelatt	National Marine Fisheries Service
~	Dave Hanson	Pacific States Marine Fisheries Commission
*	Lianna Jack	Alaska Sea Otter and Steller Sea Lion Commission
	Libby Logerwell	National Marine Fisheries Service, AFSC
*	Tom Loughlin	National Marine Fisheries Service
~	Donna Parker	F/V Arctic Storm
*	Ken Pitcher	Alaska Department of Fish and Game
**	Bob Small	Alaska Department of Fish and Game
~	Alan Springer	University of Alaska, Fairbanks
~	Ken Stump	
	Clem Tillion	Aleutian Enterprise Corp.
*	Andrew Trites	University of British Columbia & North Pacific Universities Marine Mammal Research Consortium
*	Terrie Williams	University of California, Santa Cruz
	Bill Wilson	North Pacific Fishery Management Council
*	Kate Wynne	University of Alaska, Fairbanks

* Steller Sea Lion Recovery Team Member
~ Steller Sea Lion Recovery Team Member, absent
****** Chair, Steller Sea Lion Recovery Team
† Rapporteur

STELLER SEA LION RECOVERY TEAM MEETING

14-16 September 2004
Islands and Ocean Center
Homer, Alaska
Draft Agenda

Tuesday, 14 September
8:30 am

1. Review and approval of agenda
2. Preliminary 2004 abundance survey results (Lowell)

8:45 am

3. Summary of AFSC Fisheries Interaction Team (FIT) research - Presentation by Libby Logerwell
4. Discussion of future plans for FIT research

11:00 am

5. Review and finalize sections of the Recovery Plan:
    - Section 10 – Threats Table, Cumulative, Synergistic, and Ecosystem Effects

12:00 pm – Lunch Break

1:15 – 4:30 pm

6. Continue to review and finalize sections of the Recovery Plan:
    - Conservation Measures
    - Nutritional Stress

After Dinner: Subgroups complete drafts of Narrative

Wednesday, 15 September
8:30 am

7. Continue to review and finalize sections of the Recovery Plan
    - Narrative
        - Review completed sections
        - Cross check recovery actions of Narrative with Threats
        - Break into subgroups to complete drafting of Narrative sections

12:00 pm – Lunch Break

1:15 – 4:30 pm

8. Continue to review and finalize sections of the Recovery Plan
    - Narrative
        - Continue work in subgroups
        - Review completed sections

After Dinner: Subgroups complete drafts of Narrative

Thursday, 16 September

9. Summarize status of Narrative and remaining tasks

10. Recovery Plan Revision: Status and approach for completion:
    - Implementation Schedule & Monitoring
    - Approach for completing remaining sections for eastern DPS

Adjourn early afternoon – Outing to Halibut Cove